

# MISCELLANEOUS PAPERS

\*\*\*\*\*

Centre for Entomological Studies Ankara

\*\*\*\*\*

No 87

20 12 2002

ISSN 1015-8235

## A NEW BUSHCRICKET FROM SOUTHERNMOST PART OF TURKEY (Orthoptera, Tettigoniidae)

Mustafa Ünal<sup>1</sup> Piotr Naskrecki<sup>2</sup>

**Abstract:** A new species, *Eupholidoptera akdeniz* sp.n. is described from Hatay Province, East Akdeniz Region of Turkey. - *Cent. ent. Stud., Misc. Pap.* 87: 1-5, 7 figs.

A key is prepared to distinguish it from related species.

**Key words:** *Eupholidoptera akdeniz*, Tettigoniidae, Orthoptera, taxonomy, fauna, Hatay, Turkey.

Received on July 10<sup>th</sup>, 2002.

### Introduction

Turkey is one of the main distributional area of *Eupholidoptera* Maran. The genus contains 48 species and subspecies distributed in S. Europe, Anatolia and Middle East (Ramme, 1951; Harz, 1969; Karabağ, 1958; Willemse, 1980, 1984; Salman, 1983; Otte & Naskrecki, 1997; Heller et al. 1998; Massa, 1999; Ayal et al. 1999). Among them, 19 taxa occur in the Marmara, the Ege (Aegean) and the Akdeniz (Mediterranean) Regions of Turkey (Uvarov, 1949; Ramme, 1951; Karabağ, 1956, 1958; Salman, 1983, 1990; Çıplak, 1999). Although, this short-winged bushcrickets that might be very local, have been well studied (Ramme, 1951; Willemse, 1980; Salman, 1983), undescribed species or subspecies can be found with detailed researches in the distributional area and neighbourings.

The materials have been collected in the field trip to Hatay Province, East Akdeniz Region of Turkey. The major results of that trip have been published (Naskrecki & Ünal, 1995). However, 2 males and 6 juveniles from Mağaracık, erroneously were placed under the species *Eupholidoptera wernerii* Ramme. After our identification and comparing of the morphological characters with the known species of *Eupholidoptera*, we decided that these are belong to a new species.

This paper includes description of *Eupholidoptera akdeniz* sp.n., illustrations of diagnostic features and a key to *Eupholidoptera* related to this new species. Geographical coordinates of the type locality is as follows; 36°09'N, 35°54'E. Holotype and 3 nymphs deposited in the collection of Centre for Entomological Studies, Ankara (CESA); others deposited in the Department of Ecology and Evolutionary Biology, University of Connecticut, Storrs, USA.

### Materials and Methods

The specimens (2 adults and 6 immatures) were captured by net, in the last quarter of June, 1993, and prepared as museum material. Male genitalia of the new species were dissected and macerated in 10% KOH solution. Drawings were made by drawing attachment with mirror on Stereo Microscope. After illustration, the genitalia were glued to cards pinned with the appropriate specimen. Specimens were determined by using the literature and compared with materials in the Zoological

<sup>1</sup> Abant İzzet Baysal Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, 14280 Bolu, TURKEY

<sup>2</sup> Visiting Curator in Entomology, Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138, USA

Museum of Ankara University (ZMAU) and the Entomological Museum of Abant İzzet Baysal University (EMAİBU). Terminology follows Willemse (1980) and Salman (1983).

***Eupholidoptera akdeniz* sp.n. (figs. 1-7)**

*Eupholidoptera wernerii* Ramme: Naskrecki & Ünal, 1995: 403.

**Material examined:** Turkey: Hatay Province, Samandağ, Mağaracık, 10-30m, 22 vi 1993, 1 ♂ (holotype), 3 nymphs, same data as holotype (Cesa); 1 ♂, 3 nymphs, same data as holotype, Naskrecki & Ünal, (in the Department of Ecology and Evolutionary Biology, University of Connecticut, Storrs, USA).

**Description:** Holotype (♂): Head. Antennal scape half of the widest part of fastigium of vertex and width of eye; broader than anterior margin of fastigium. Fronto-clypeal sture slightly convex. Head longer than wide in anterior view.

Thorax. Pronotum (Fig. 1) almost cylindrical; reaching beyond the first abdominal tergite; anterior margin slightly concave, posterior margin strongly rounded; metazona 0.2mm longer than prozona; first transverse sulcus distinct in lateral view, 1.7mm behind the anterior margin of pronotum; dorsal surface smooth. Tegmina is fully covered by pronotum in dorsal view; extending end of first abdominal tergite, it can be seen in lateral view (Fig. 1). Fore coxa with broad triangular spine. Fore femur with 4-6 spines inside ventrally; genicular lobes of fore femur armed with distinct denticles only on inner side. Fore tibia with 3 spines outside dorsally and with 6 spines outside ventrally. Outer genicular lobes of middle femur armed with 2 denticles, inner lobes with 1 denticle. Hind femur long; 2.4 times longer than pronotum; genicular lobes armed with an indistinct denticle.

Abdomen. Tenth abdominal tergite large, longer than eighth and ninth tergites together; posterior margin almost straight with a small, rectangular median incision (Fig. 2). Cercus (Fig. 3) almost straight, apical 1/3 narrow and slightly incurved, basal 2/3 broad and gradually narrowing to middle; with a large internal tooth at base, its both margins convex, with slightly curved apical spine. Subgenital plate (Fig. 4) longer than wide; inner margins of apical lobes with distinct protuberance; posterior margins pointed with single acute spine inwardly at base of styli (Fig. 5); styli (Fig. 4) relatively long (1.8 mm), ratio of styli and subgenital plate: 1/ 2.5. Titillator (Figs. 6, 7) slender, narrow and long; apical part very long, its arms parallel and touching each other (Fig. 6), strongly recurved (Fig. 7), the tips pointed acutely; basal half of apical arms broad; fused part long and slender, gradually narrowing to base; basal arms short and narrow, nearly as long as fused part in anterior view.

Female (last instar immature). Pronotum and ovipositor very long. Pronotum longer than abdomen, posterior margin strongly rounded. Ovipositor slightly longer than body. Hind femur longer than ovipositor and body. Subgenital plate with deep triangular incision, its lobes wide and triangular. Body mostly brown; face, vertex, both margins of occiput, pronotal lobes, outer surface of middle and hind femorae with black spots and stripes. Ventral surface of hind femur greenish.

General Coloration. Body brown, yellow and black. Face greenish yellow. Frons with four black spots and some black stripes. Clypeus with four small spots. Hind margin of eye vertically, both margins of occiput, anterior margin of vertex and around of antennal foramen with black stripes. Antennal scape with irregular black spots, flagellum brown. Pronotum with three colores, dorsal surface brown with a light stripe in the middle; pronotal lobes partly black, lower margin with a broad yellow band (Fig. 1). Ventral surfaces of all femorae green. Fore and middle legs brown with black spots and stripes. Hind femur brown; with piecemeal black stripe on outer surface and with smaller one on inner surface; genicular lobes black. Hind tibia brown; with dark brown spines. Tenth abdominal tergite fully black, all other tergites unicolored brown. Cercus dark brown; with a light band from base of internal tooth to tip of cercus (Fig. 3); distal half of internal tooth light brown, apical spine darkened. Subgenital plate yellow, with black stripes laterally (Fig. 4). All abdominal sternites greenish yellow.

**Measurements (mm):** ♂ (holotype). Length of body 22.1; pronotum 10; hind femur 23.8; hind tibia 23.2; width of vertex 2.1; width of scapus 1; width of eye 1.9; cercus (without internal tooth) 3.5, (with internal tooth) 4.

**Diagnosis:** This new species is unique in the genus and easily recognizable by the shape of titillator, tenth tergite and subgenital plate. Similarities of new species are quite poor with other known species but some of them could be mentioned, are below.

New species has slightly similar median incision of tenth abdominal tergite with the following species: *E. chabrieri* ssp. from S. Europe, *E. epirotica* Ramme from Greece, *E. megastyla* Ramme from Greece and Italy, *E. leucasi* Willemse from Greece and *E. prasina* from W. Turkey but differs from them by the shape of posterior margin of tenth tergite is not pointed and absence of apical processes, the shape of titillator and subgenital plate. It has similar cercus with *E. chabrieri chabrieri* (Charpentier) from Col de Brouis Castellane (Willemse, 1980: 46) but the shape of titillator, subgenital plate and tenth abdominal tergite are quite different. This new species near *E. wernerii* Ramme from Hatay province of Turkey and Syria by the shape of subgenital plate but differs from it in the presence of single spine at the base of styli, the shape of titillator, tenth abdominal tergite and cercus. Other similar species include *E. kinzelbachi* Harz and *E. megastyla* Ramme by very close and parallel apical arms of titillator but the general structure of titillator and tenth abdominal tergite, subgenital plate and cercus are very different from these Greek species.

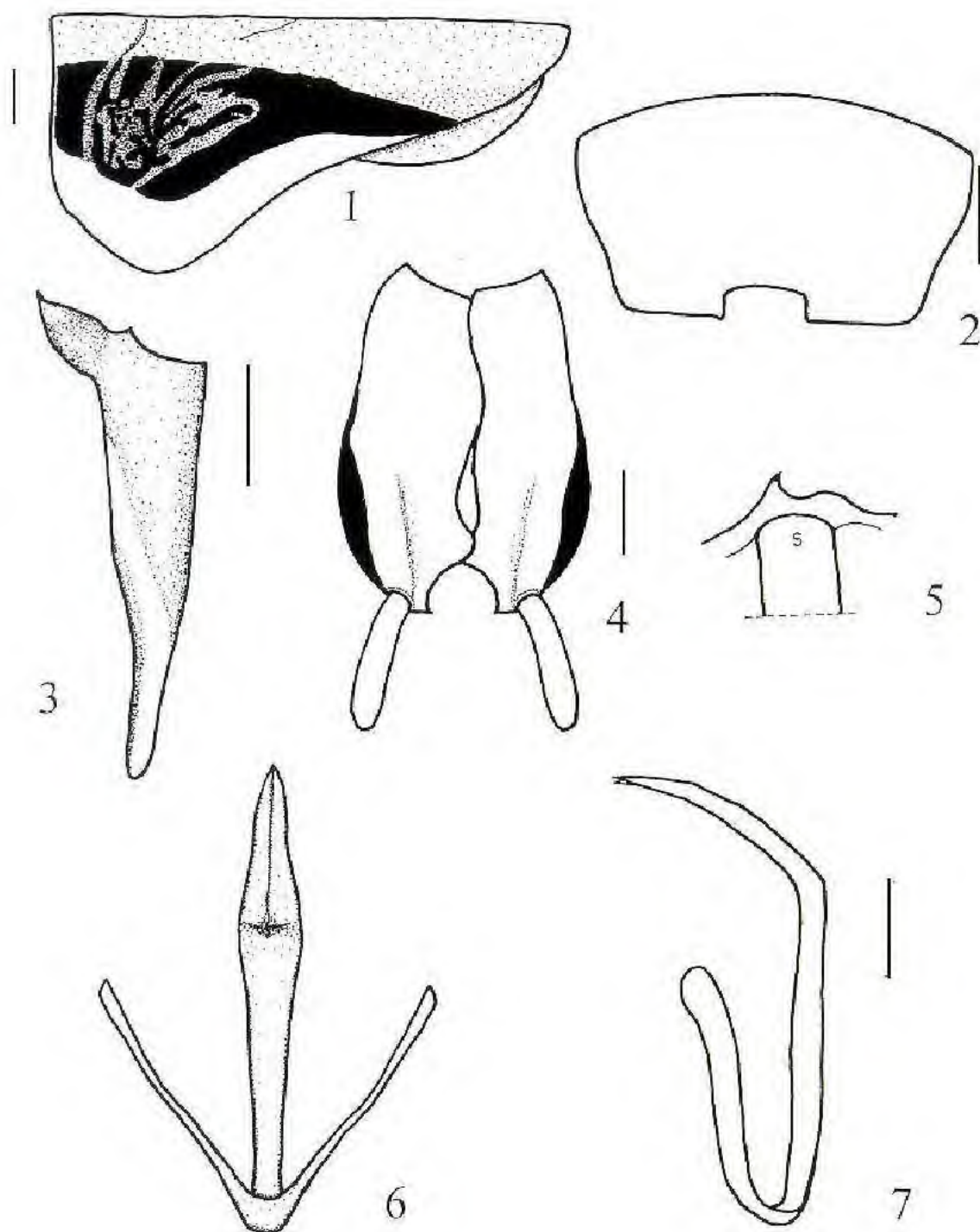
**Etymology:** The name of the species is derived from the Akdeniz (Mediterranean Sea). The specimens were collected from slope of hills where near the coast.

#### Key to males of *Eupholidoptera* related to *E. akdeniz* sp.n.

These species are characterized by the presence of internal tooth of male cercus and with very close or touching apical arms of titillator. Modified from Willemse (1981, 1985) and Salman (1983).

1. Cercus with internal tooth situated just distal to base.....2
- Cercus with internal tooth situated at base (Fig.3).....3
2. Posterior margin of tenth abdominal tergite with distinct median incision, its posterior processes near each other. Apical arms of titillator not crossed.....*E. peneri* Kaltenbach. Known only from Israel (Ayal et al, 1999).
- Posterior margin of tenth abdominal tergite without median incision, its posterior processes far from each other. Apical arms of titillator crossed.....*E. annulipes* (Brunner von Wattenwyl). Known from S. Turkey (Salman, 1983).
3. Apical arms of titillator not curved or slightly curved in profile, fused part broader than unfused part in anterior view.....4
- Apical arms of titillator strongly curved in profile (Fig. 7), fused part narrower than unfused part in anterior view (Fig. 6) .....5
4. Styli longer than half length of cercus. Titillator slender, basal arms very short, not extending to unfused part of apical arms.....*E. megastyla* (Ramme). Known from Greece and S. Italy (Willemse 1980, 1984).
- Styli shorter than half length of cercus. Titillator stout, basal arms long, extending to unfused part of apical arms.....*E. dunconai* La Greca. Known from S. Italy (Harz, 1969; Massa, 1999).
5. Basal arms of titillator short, not extending to unfused part of apical arms; apical half of unfused part narrower than basal half, strongly curved under at angle and narrowing to tip (Figs. 6, 7). Cercus quite straight, basal 2/3 broad, apical 1/3 strongly narrowed; internal tooth large, as long as the widest part of cercus (Fig.3).....*E. akdeniz* sp.n.
- Basal arms of titillator long, surpassing to half of unfused part; apical half of unfused part broader than basal half, gradually curved in lateral view. Cercus slightly incurved, basal 1/3 broad, the remainder gradually narrowing, internal tooth small, shorter than the widest part of cercus.....*E. kinzelbachi* Harz. Known only from southern Peloponnisos in Greece (Willemse, 1984).





**Explanation of the Figures.** Figs. 1-7. *Eupholidoptera akdeniz* sp.n., male, (1) pronotum and tegmina, lateral view; (2) tenth abdominal tergite, from above; (3) cercus; (4) subgenital plate, from below; (5) base of styli; (6) titillator, anterior view; (7) ditto, lateral view. Scale bars 1mm.

**Literature:**

- Ayal, Y., Broza, M. & Pener, M.P. 1999. Geographical Distribution and Habitat Segregation of Bushcrickets (Orthoptera: Tettigoniidae) in Israel. *Israel J. Zool.*, 45: 49-64.
- Bader, A.K. & Massa, B. 2001. Tettigoniidae (Orthoptera) from Jordan with description of new species and redescription of less known species. *J. Orthoptera Res.*, 10(1): 25-37.
- Çıplak, B. 1999. Two new species of *Eupholidoptera* Maran (Orthoptera, Tettigoniidae): *E. tasheliensis* n.sp. and *E. femorata* n.sp., *Ital. J. Zool.*, 66: 75-78.
- Harz, K. 1969. The Orthoptera of Europe (Die Orthopteren Europas). 1:1-749.
- Harz, K. 1988. Eine neue *Eupholidoptera*-Art aus der Türkei (Ensifera, Decticinae). *Articulata*, 3(4): 133-135.
- Heller, K.G., Korsunovskaya, O., Ragge, D.R., Vedenina, V., Willemse, F., Zhantiev, R.D. & Frantsevich, L. 1998. Check-List of European Orthoptera. *Articulata*, 7: 1-61.
- Kaltenbach, A. 1969. Saginae und Decticinae aus Israel I. *Annln. naturh.. Mus. Wien*, 73: 333-338.
- Karabağ, T. 1956. Some new and less known Tettigoniidae (Orthoptera) from Turkey. *Communs Fac. Sci. Univ. Ankara*, (Ser. C), 5: 1-19.
- Karabağ, T. 1958. *Türkiye'nin Orthoptera faunası. The Orthoptera fauna of Turkey*. 198 pp. İstanbul.
- Koçak, A.Ö., 1981, On the Nomenclature of some Genera of Orthoptera. *Priamus*, 1(3): 126-128.
- Maran, J., 1953. Contribution to the knowledge of the genus *Pholidoptera* Wesm. *Acta. ent. Mus. Natn. Pragae* 28: 209-221.
- Massa, B. 1999. Ortoteri Dell'area Mediterranea e delle Isole Azzorre Nuovi o Poco Noti. *Atti Acc. Rov. Agiati*, 9 (7): B, 57-80.
- Naskrecki, P. & Ünal, M. 1995. The Orthoptera of Hatay Province, S.Turkey. *Beitr. Ent.*, 45 (2): 393-419.
- Otte, D. & Naskrecki, P. 1997. Orthoptera Species Online. <http://viceroy.eeb.uconn.edu/Orthoptera>.
- Ramme, W. 1939. Beiträge zur Kenntnis der palaearktischen Orthopterenfauna (Tettig.u. Acrid.) III. *Mitt. zool. Mus. Berlin*, 24 (1): 41-150.
- Ramme, W. 1951. Zur Systematik Faunistik und Biologie der Orthopteren von Südost Europa und Vorderasien. *Mitt. zool. Mus. Berlin*, 27:1-431.
- Salman, S. 1983. The bush-cricket of the genus *Eupholidoptera* (Decticinae). *Syst. Ent.*, 8: 313-338.
- Salman, S. 1990. Türkiye Pholidopterini (Insecta, Orthoptera) Faunası. X. Ulusal Biyoloji Kongresi, Erzurum, 101-108.
- Uvarov, B.P. 1949. A new *Pholidoptera* from S.W. Turkey (Orthoptera, Tettigoniidae). *Proc. R. Ent. Soc. London*, B 18 (1-2): 1-2.
- Willemse, F. 1980. Classification and distribution of the species of *Eupholidoptera* Ramme of Greece (Orthoptera, Tettigoniioidea, Decticinae). *Tijdschr. Ent.*, 123:39-69.
- Willemse, F. 1984. *Catalogue of the Orthoptera of Greece. Fauna Graeciae*, I: 1-275.
- Willemse, F. 1985. *A Key to Orthoptera species of Greece. Fauna Graeciae*, II: 1-288.

\*\*\*\*\*

## Van'da Üç Nadir Sinirkanatlı Türü Hakkında (*Planipennia*, *Ascalaphidae*, *Nemopteridae*)

**Ahmet Ömer Koçak    Muhabbet Kemal**

**Abstract:** On three rare Neuropterid species at Van (*Planipennia*, *Ascalaphidae*, *Nemopteridae*). Cent. ent. Stud., Misc. Pap. 87: 5-8, 6 figs. This short paper deals with the new records for fauna of Van Province (East Turkey). *Bubopsis hamata* (Klug,1834), *Deleproctophylla variegata* (Klug,1834) in the family *Ascalaphidae*, and *Kirbynia (Olivierina) extensa* (Olivier,1811) in the family *Nemopteridae*, are among rarest species in Turkey. They inhabit in extremely dry mountain steppe in Province Van.

**Keywords:** Fauna, new records, Van, Turkey, *Ascalaphidae*, *Nemopteridae*, *Planipennia*.



Bu makalede, Van vilayeti dahilinde bulunan 3 sinirkanatlı türüne ait bazı faunistik morfolojik ve ekolojik tespitlere yer verilmiştir.

*Ascalaphidae* familyasına ait *Bubopsis hamata* ve *Deleproctophylla variegata* türlerinin ergin örnekleri Van'ın kurak dağ stebi ve kayalık yamaçlarında bulunmuştur. Yaz günlerinin sıcak ve güneşli saatlerinde aktif olan ve uçan diğer küçük böcekleri avlayarak beslenen bu türler Van ili dahilinde ilk defa tespit edilmiştir. *Deleproctophylla variegata* Van şehrinin kuzeydoğusunda yer alan Hoş gedğinde bulunmuştur. Bu lokalitenin güneybatısına bakan yamaçların Van şehrinin açık çöplüğü olması, bu türün yaşama alanını tehdit etmektedir. Lokalitede yapılan aramalar sonucunda sadece bir dişi bireyin bulunması, türün popülasyonunun çok zayıf olduğunun bir işaretidir. Popülasyon ile ilgili benzer durum *Bubopsis hamata* için de tespit edilmiştir. Bu nedenle, her iki türün de Doğu Anadolu'da koruma altına alınması gereklidir.

Van'da ilk defa tespit edilen üçüncü *Neuropter* türü ise *Nemopteridae* familyasına ait olan *Kirbynia (Olivierina) extensa*'dır. Bu familyaya ait olan, Doğu ve Güney Anadolu'da orman açıklıklarında yaygın olarak bulunan *Nemoptera sinuata* türüne Van'ın güneyindeki meşeliklerde de rastlanmaktadır. *Kirbynia extensa* türü, *Nemoptera sinuata*'dan farklı olarak orman yerine kurak dağ stebini tercih etmektedir. *Kirbynia extensa*'nın erginleri *Pimpinella* cinsine bağlı *Apiaceae* türlerinin çiçek tablaları üzerinde polenlerle beslenirken tespit edilmiştir. Kanatlarının şeffaf olması bireylerin *Pimpinella*'nın beyazımsı çiçek tablasında kendilerini kamufle edebilmesini sağlamaktadır. Arka kanatlarının ucundaki kahverengi loblar sayesinde farkedilmeleri mümkün olmaktadır. Genel olarak, *Nemopteridae* larvalarının kumlu zeminlerde yaşadığı bilinirken, özellikle *K. extensa* türünün erken gelişme dönemlerine ait literatürde bir bilgi bulunmamaktadır. *Nemopter*'ler üzerine son yıllarda yayınladıkları makalelerinde Aspöck, Aspöck & Hölzel (1984), Anadolu'dan *Kirbynia schmidtii*, *Lertha vartianae* ile İran'dan *Lertha ressi* türlerini tanımlamışlardır. Bu yazarlar *Kirbynia extensa* ile ilgili olarak Anadolu, İran ve Irak'tan toplanmış çok sayıda örneği incelendiklerini belirtirken örneklerin toplandıkları yerleri açıklamamışlardır. Yayımlanan bilgiler ışığında *Kirbynia extensa* Van'da ilk defa bulunmaktadır.

Söz konusu üç *Neuropter* türü ile ilgili bazı vücut ölçüleri 1. ve 2. Tablo'da belirtilmiştir. Türlerin erginleri ise 6 şekilde resmedilmiştir. Ayrıca, türlerin toplama kayıtları incelenen materyal bölümünde belirtilmiştir.

### *Ascalaphidae*

#### *Bubopsis hamata* (Klug,1834)

İncelenen Materyal: 1 ♂ 1 ♀ Van, Gürpınar, Zerne Barajı, 2100m 20.7.2002 A.Koçak & M.Kemal leg. (coll. Cesa).

Tablo 1. *Ascalaphid* türlerinde kanat ve anten ölçüleri (mm). A- Ön kanat genişliği, B - Ön kanat boyu, C- Arka kanat boyu, D- Anten boyu.

Takson (Lokalite)	Eşey	A	B	C	D
<i>Bubopsis hamata</i> (Zerne)	♂	54	26	23	17
<i>Bubopsis hamata</i> (Zerne)	♀	59	28	25	18
<i>Deleproctophylla variegata</i> (Hoş)	♀	42-43,5	20-22	15-15,5	10,5-12



Şekil 1. *Bubopsis hamata* ♂ (Zerne Barajı)



Şekil 2. *Bubopsis hamata* ♀ (Zerne Barajı)

***Deleproctophylla variegata* (Klug,1834)**

İncelenen Materyal: 2 ♀ Van, Hoş Gediği, 2100m, 25.7.2002 A.Koçak & M.Kemal leg. (coll. Cesa).



Şekil 3. *Deleproctophylla variegata* ♀ (Hoş gediği)

***Nemopteridae******Kirbynia (Olivierina) extensa* (Olivier,1811)**

İncelenen Materyal: 2 ♂ 1 ♀ Van, Anzaf kalesi 2000m 11-13.7.2002 Ziegler leg. (coll. Cesa); 1 ♂ Van, Gevaş, Kızıltaş N., 1750m, 28.7.2002 A.Koçak leg. (coll. Cesa); 1 ♂ 1 ♀ Van, Çatak, Çatak vadisi 3km NNE, 1500m, 28.7.2002 A.Koçak leg. (coll. Cesa).

Tablo 2. *Kirbynia extensa* ile ilgili kanat ölçüleri (mm). A - Ön kanat genişliği, B - Ön kanat boyu, C - Arka kanat boyu, D - Arka kanatta proximal lop genişliği

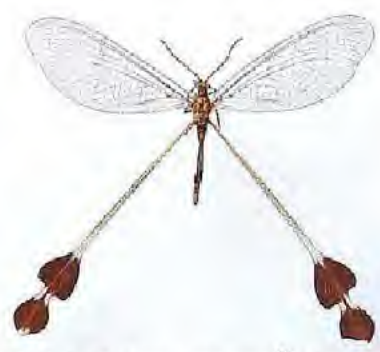
Takson (Lokalite)	Eşey	A	B	C	D
<i>Kirbynia extensa</i> (Kızıltaş)	♂	40	20	36	3,5
<i>Kirbynia extensa</i> (Kızıltaş)	♀	42	21	34	5
<i>Kirbynia extensa</i> (Çatak)	♂	39	21	35	5
<i>Kirbynia extensa</i> (Çatak)	♀	39	19	31	5
<i>Kirbynia extensa</i> (Hoş)	♂	43	22	39	4
<i>Kirbynia extensa</i> (Anzaf)	♂	44	22,5	40	4



Şekil 4. *Kirbynia extensa* ♂ (Hoş gediği)



Şekil 5. *Kirbynia extensa* ♂ (Çatak)



Şekil 6. *Kirbynia extensa* ♀ (Çatak)

**Literatür:**

Hölzel, H., 1968, Die Neuropteren Vorderasiens III. Nemopteridae. *Beitr. Naturk. Forsch. SW-Dtl.* 27 (1): 37-47, 16 Abb.



Aspöck, H., Aspöck, U. & H. Hölzel, 1980, *Die Neuropteren Europas. Eine zusammenfassende Darstellung der Systematik, Ökologie und Chorologie der Neuropteroidea (Megaloptera, Rhaphidioptera, Planipennia)*. 2 Bde. 495S., 355S. Krefeld (Goecke & Evers).

Aspöck, H., Aspöck, U. & H. Hölzel, 1984, Neue Spezies der Genera *Kirbunia* Navas und *Lertha* Navas aus Vorderasien und Bemerkungen über *Olivierina extensa* (Olivier) (Neuropteroidea: Planipennia, Nemopteridae). *Ent. Z., Frankf. a. M.* 94 (9): 113-128, 11 Abb.

\*\*\*\*\*

**Contents / İçindekiler:** Ünal, M. & P. Naskrečki, A new species, *Eupholidoptera akdeniz* sp.n. is described from Hatay Province, East Akdeniz Region of Turkey. p.1; Koçak, A.Ö. & M. Kemal, On three rare Neuropterids species at Van (Planipennia, Ascalaphidae, Nemopteridae). p.5. Editorial, p.8.

## MISCELLANEOUS PAPERS

ISSN 1015-8235

Miscellaneous Papers is the second international serial of the Centre for Entomological Studies Ankara (Cesa). It includes original papers of the research workers of the Centre on ecology, fauna, flora, distribution, check-list, taxonomy, nomenclature and morphology, as well as information and announcements from the Centre. The publication language are Turkish, Uighurian, English, German and Chinese.

## Centre for Entomological Studies Ankara

(A scientific Consortium)

(co-operation of a number of research workers for pure-scientific, not commercial purpose)

**Web Page of the Cesa:** [http://www.members.tripod.com/Cesa\\_1988/on.html](http://www.members.tripod.com/Cesa_1988/on.html)

**Scientific Serials:** Priamus (ISSN 1015-8243), Miscellaneous Papers (ISSN 1015-8235), Memoirs (ISSN-8227)

News of the month, an electronical magazine of the Cesa in the internet.

<http://www.members.tripod.com/entlep/News6.htm>

**Owner / Sahibi - Editor / Yayıncı:** Prof. Dr. Ahmet Ömer Koçak - Editor Assistants: Yrd. Doç. Dr. Muhabbet Kemal, Dr. Selma Seven, M.Sc. Emine Demir.

**Editorial Board of all Scientific Serials / Bütün Bilimsel Yayınların Yayın Kurulu:** Insecta, taxonomy, nomenclature, ecology, faunistics: Prof. Dr. Ahmet Ömer Koçak (Turkey), Dr. Selma Seven (Turkey), Yrd. Doç. Dr. Muhabbet Kemal, Yrd. Doç. Dr. Yusuf Hüseyinoğlu (Turkey), Mr. Günter Ebert (Germany), Dr. Thomas Meineke (Germany). Homoptera: M.Sc. Emine Demir (Turkey). Orthoptera: Dr. Piotr Naskrečki (U.S.A.), Yrd. Doç. Dr. Mustafa Ünal (Turkey). Coleoptera / Chrysomelidae: Ass. Prof. M. S. Mohammedsaid (Malaysia). - Plant taxonomy, flora and vegetation: Prof. Dr. Mecit Vural (Turkey), Doç. Dr. Nezaket Adıgüzel (Turkey).

ALL RIGHTS RESERVED

Correspondences should be addressed to: Prof. Dr. Ahmet Ömer Koçak, 100. Yıl University, Fen-Edebiyat Fakültesi Biyoloji Bölümü, Kampus, Van / Turkey. e-mail: [a\\_kocak@mailcity.com](mailto:a_kocak@mailcity.com)

MISCELLANEOUS PAPERS AYDA BİR  
YAYINLANIR

Yüzüncü Yıl Üniversitesi Matbaasında bastırılmıştır.

All serials are recorded regularly by the Zoological Record, Biosis, Garforth House, 54 Micklegate, York, North Yorkshire. fax (01904) 612793 - [DCS@york.biosis.org](mailto:DCS@york.biosis.org)